

Spectrum Management

Broadcasting Circular

# **AM, FM and TV Broadcasting Process**

## NOTICE

Broadcasting circulars are issued for the guidance of departmental staff and are complementary to the **Broadcasting Procedures and Rules.**

## **Foreword**

In the spring of 1992, the Spectrum Management Operations Committee (SMOC) approved the report of the Spectrum Management Broadcasting Operations (SMBO) subcommittee on the regionalization of certain broadcasting activities. This regionalization is reflected in this broadcasting circular on the AM, FM and TV broadcasting process.

## **Purpose**

This circular describes the general procedure to be followed in the submission, processing and certification of applications for AM, FM and TV broadcasting undertakings, including experimental undertakings, in evaluating foreign notifications and in evaluating proofs of performance for AM undertakings.

## **Procedure**

Many interrelated factors come into play in the evaluation process including regional/district activities, HQ activities, the CRTC and international considerations. Since the process is a complex one, the procedure is broken down into a large number of tasks with responsibility for each task identified.

The procedure to be followed with respect to the areas covered by this circular are contained in Annex I.

Annex I identifies nine major activities A, B, ...G. For each major activity, a diagram outlines the main steps involved in block form, showing the relationship between blocks. In cases where further detail is required, a label is attached to the block. This label indicates that additional detail follows in text form.

**ANNEX I**

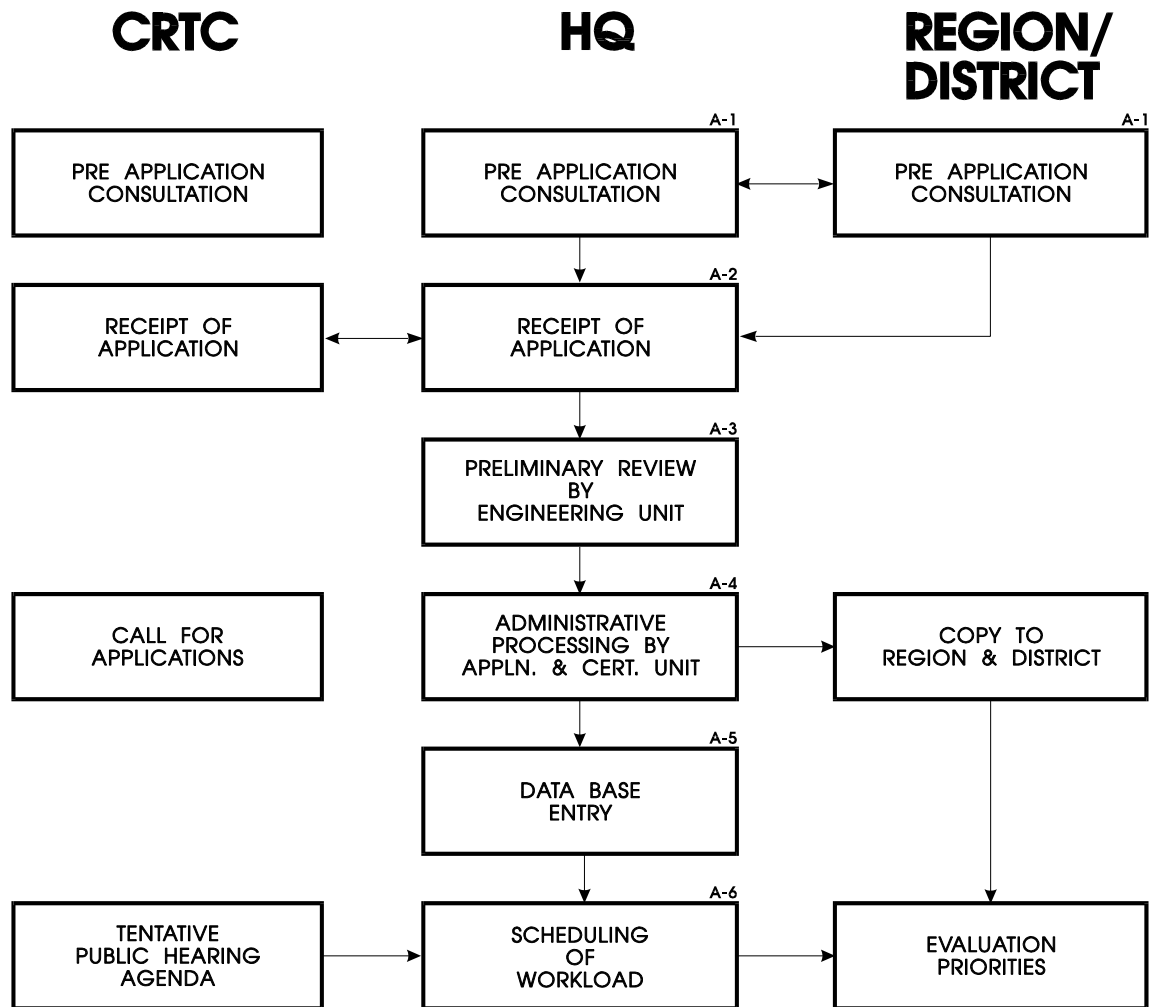
**AM, FM and TV BROADCASTING**

**PROCESS**

# AM, FM AND TV BROADCASTING PROCESS TABLE OF CONTENTS

	<u>PAGE</u>
A APPLICATION SUBMISSIONS	(4)
↓	
& B APPLICATION PROCESSING C	(7)
↓	
D CERTIFICATION	(16)
←	
E PROOFS	(19)
↓	
F FOREIGN NOTIFICATIONS	(27)
↓	
G EXPERIMENTAL AUTHORIZATIONS	(29)

## A - APPLICATION SUBMISSIONS



## **A - APPLICATION SUBMISSIONS**

### **A1 - Consultation**

#### **HQ**

Before applying, the applicant or the consultant may seek HQ advice re:

- frequency choice: allotted, drop-in, change in allotment plan;
- technical rules: protection to existing broadcasting and other radio services, e.g. land mobile, aeronautical radio-navigation and communications, etc.
- regulatory programme: interpretation and application of rules, procedures, regulations, working arrangement and agreements, policies and practices.

#### **Region/District**

The applicant or the consultant (especially for lower power undertakings by small community groups) may seek regional advice on:

- regulatory advice: interpretation and application of rules, procedures and regulations, local issues;
- technical advice: design, equipment, coverage;
- frequency choice: may suggest frequency after consulting with HQ.

### **A2 - Receipt of Application**

Eventually, an application for a broadcasting undertaking is filed with the Department. If submitted at region or district level, it should be sent to HQ. The Applications and Certification Unit checks with the CRTC for a parallel application. In case the latter is not filed, a reminder is sent to the applicant for his action. A file is opened for the received documentation.

### **A3 - Preliminary Review by Engineering Unit**

A cursory examination of the technical brief is undertaken to ensure that requirements re channel, site, parameters, interference analyses and coverage are included. A notification under the Working Arrangement may be made if warranted. Technical database entries are prepared.

In FM, a short-spacing study is done to flush out any major problem. Concurrently, an FM/NAV/COM compatibility analysis is done for the same objective.

#### **A4 - Administrative Processing by Applications and Certification Unit**

This unit checks for completeness re forms, technical briefs, coverage maps and reproducibles, commitments, etc. For call sign requests, an analysis is undertaken to confirm availability and a reservation is made. A letter of acknowledgement is prepared including a request for missing documentation. Copies of correspondence and technical briefs are sent to the Region, District and the CRTC.

#### **A5 - Database Entry**

The first entry in the database comprising administrative and technical information is completed at this time.

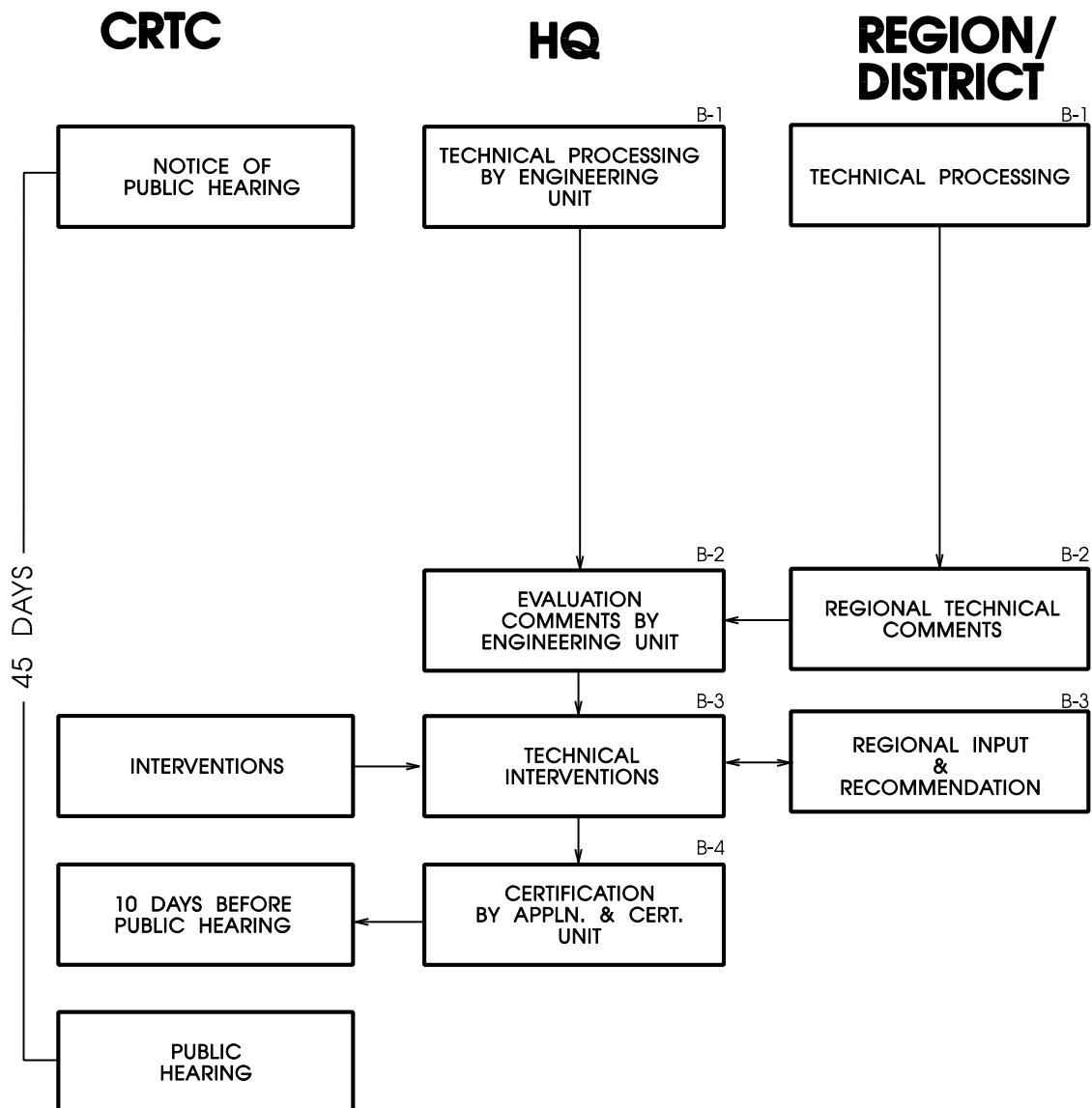
#### **A6 - Scheduling of Workload**

Following the above steps, the application is scheduled on a chronological basis. More often, a CRTC confidential tentative Public Hearing Agenda is received and the section workload is rescheduled accordingly and the Region is notified.

## B - APPLICATION PROCESSING

**FOR REGULAR AND LOW POWER UNDERTAKINGS  
PREPARED BY  
BROADCAST ENGINEERING CONSULTANTS**

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## **B - APPLICATION PROCESSING FOR REGULAR AND LOW POWER UNDERTAKINGS PREPARED BY BROADCASTING ENGINEERING CONSULTANTS**

### **B1 - Technical Processing**

#### **HQ**

The following steps are involved and may require discussions with consultants:

- (a) Proposed parameters: verification of class, power, antenna patterns and any other calculation pertaining thereto.
- (b) Channel analysis: to determine conflicts within service or inter-service (AM, FM, TV, TV/LM, FM/NAV, FM/TV, AM/NAV):
  - to analyze protection or short-spacings, domestically and internationally;
  - to determine assignment limitations;
  - to analyze all amendments to the Plans;
  - to ensure applicant has notified affected assignments as required.

Given above results, a judgement is made on rules applicability or rule relaxation in order to enable a decision regarding acceptability under regular or special case conditions.

- (c) Technical mutual exclusivities: Applications are analyzed with regard to technical mutual exclusivities which concern incompatible frequency choices. They are identified and consultants are requested to resolve the exclusivity after the agreement of the applicants has been obtained. This action applies particularly to TV and FM.
- (d) Rebroadcasting proposals: This is important as only one rule exists in FM to cover the full-time rebroadcast applications. All other aspects, where duplication of service is part-time, have to be judged against precedents, efficient spectrum utilization practices and departmental policies before a decision on acceptability is reached.
- (e) Coverage: determine correctness of service contours; where required, a "realistic" coverage analysis is undertaken (TV and FM).
- (f) International notifications under CAN/US, CAN/France, CAN/REGION II COUNTRIES and IFRB:
  - as a pre-requisite to notifying Canadian plans, changes and assignments, the channel analysis in (b) is carried out to ensure compliance with appropriate agreements, arrangements, etc.;
  - proposals that do not meet rules require special consideration with regard to precedents, saleability, return impact on Canada. Judgement and experience are required in the conduct of special negotiations.

- (g) Co-ordination with Region as required.
- (h) Database update: if required, due to revisions or other changes, database updates are carried out.

### **Region/District**

The following steps are involved and may require discussions with consultants:

- (a) **Ghosting or re-radiation analysis:** this is performed to determine the impact of proposed and existing towers/structures on TV and FM reception as well as on AM radiation patterns. Analysis results are interpreted and a decision is reached based on experience, precedents over and above known criteria which are based on bench tests.
- (b) **Overload analysis:**
  - to calculate and verify contours;
  - to verify population count and estimate impact;
  - in TV an analysis is also carried out on overlapping adjacent channel service contours;
  - confirm municipal notification.

The impact of overload and intermodulation effects is assessed based on experience, precedents and site location.

- (c) **RF exposure limit analysis:**
  - to calculate and verify RF exposure;
  - estimate impact on area especially if populated;
  - judgement is made on applicant's submission and commitments.
- (d) **Site evaluation process considering the following:**
  - impact on broadcast and radio services;
  - impact on local listening or viewing habits;
  - physical impact of proposed site re municipal and environmental concerns (Environmental Impact Assessment, EIA) including social and cultural considerations, etc;
  - resolution of municipal problems, if any.

- (e) Site clearance by Transport Canada (TC):
  - ensure aeronautical navigation hazard clearance is applied for as per TC's requirements and clearance obtained.
- (f) Co-ordination with HQ as required.

**NOTE:** If major revisions to the technical brief are required during technical processing, most of the steps above have to be repeated.

## **B2 - Evaluation Comments**

**Regional comments:** following their evaluation the Region develops technical comments for referral to HQ.

**HQ comments:** following receipt of Regional technical comments and completion of its own technical evaluation, formal comments are prepared for referral to the CRTC (following agreement with Region).

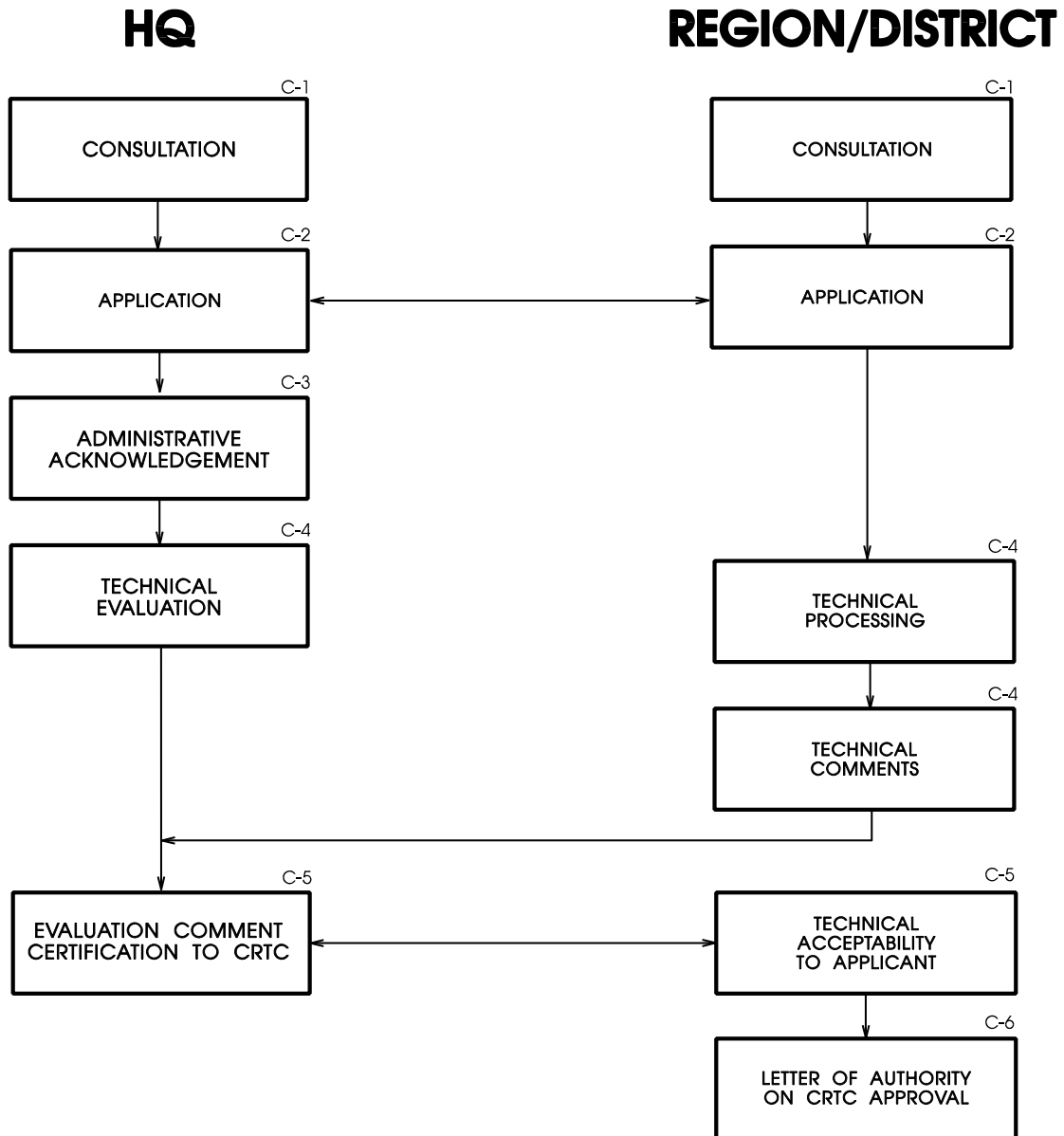
## **B3 - Interventions**

The CRTC should refer any technical intervention it received for Departmental consideration. HQ analyzes the intervention, contacts the parties involved with a view to resolving the problem (if required) and comments to the CRTC accordingly. This action may require regional input in terms of comments or a recommendation, mediation or an investigation.

## **B4 - Certification of Application**

The Applications and Certification Unit refers the technical evaluation comments to CRTC under cover of a letter which also notifies the Department's intention to issue a Certificate should the application be approved by the CRTC. This certification has to reach the CRTC at the latest ten days before a Public Hearing is held, otherwise the Commission pulls the item from the Hearing. At the same time Industry Canada notifies the applicant that technical acceptability has been granted.

## C - LOW POWER APPLICATION PROCESSING (FROM NEW CLASS OF APPLICANT)



## **C - APPLICATION PROCESSING FOR LOW POWER UNDERTAKINGS FROM NEW CLASS OF APPLICANT**

### **C1 - Pre-Application Processing**

#### **HQ**

This new class of applicant may inquire with HQ for advice and information regarding administrative and technical regulations. This is given referral to Region for further guidance and application procedures, assistance, etc.

#### **Region/District**

This new class of applicant normally visits regional/district offices for:

- technical regulatory and administrative information;
- all assistance required to complete application. Region/District provides full guidance, including parameters, coverage and frequency choice. The latter step requires frequency approval from HQ.

### **C2 - Application**

#### **HQ**

May receive application from the CRTC or directly from applicant but normally from Region. Checks with the CRTC for parallel application and opens file.

#### **Region/District**

Ensures application documentation is complete and refers to HQ for acknowledgement, keeping required copy for technical evaluation.

### **C3 - Acknowledgement**

#### **HQ**

HQ acknowledges receipt of application with copies of correspondence to the CRTC, Region and District. Database entry is made at this time.

## **C4 - Technical Processing**

### **HQ**

The following steps are involved:

- (a) Frequency review to identify major problems.
- (b) Co-ordinates with Region/District re frequency problem and resolution.
- (c) International notification as required.
- (d) FM/NAV/COM analysis and notification to TC with copy of reply to Region/District.
- (e) Technical evaluation: co-ordination with Region/District as required.
- (f) Database update.

### **Region/District**

The following steps are involved:

- (a) Parameters and verification of class, coverage, interference analysis.
- (b) Ghosting or re-radiation analysis: this is performed to determine the impact of proposed and existing towers/structures on TV and FM reception as well as on AM radiation patterns. Analysis results are interpreted and a decision is reached based on experience, precedents over and above known criteria which are based on bench tests.
- (c) Overload analysis:
  - to calculate and verify contours;
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  - in TV an analysis is also carried out on overlapping adjacent channel service contours;
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The impact of overload and intermodulation effects is assessed based on experience, precedents and site location.

- (d) RF exposure limit analysis:
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  - judgement is made on applicant's submission and commitments.

- (e) Site evaluation process considering the following:
- impact on broadcast and radio services;
  - impact on local listening or viewing habits;
  - physical impact of proposed site re municipal and environmental concerns (Environmental Impact Assessment, EIA) including social and cultural considerations, etc.;
  - resolution of municipal problems, if any.
- (f) Site clearance by Transport Canada:
- ensure aeronautical navigation hazard clearance is applied for as per TC's requirements and clearance obtained.
- (g) Co-ordination with HQ as required.

**NOTE:** If major revisions to the technical brief are required during technical processing, most of the steps above have to be repeated.

## C5 - Evaluation Comments and Certification

**Regional comments:** following their evaluation the Region develops technical comments for referral to HQ.

**HQ comments:** following receipt of regional technical comments, formal comments are prepared for referral to the CRTC.

The Applications and Certification Unit refers the technical evaluation comments to the CRTC under cover of a letter which also notifies the Department's intention to issue a Certificate should the application be approved by the CRTC. This certification has to reach the CRTC at the latest ten days before a Public Hearing is held otherwise the Commission pulls the item from the Hearing. At the same time, the Region notifies the applicant that technical acceptability has been granted.

## **C6 - Letter of Authority**

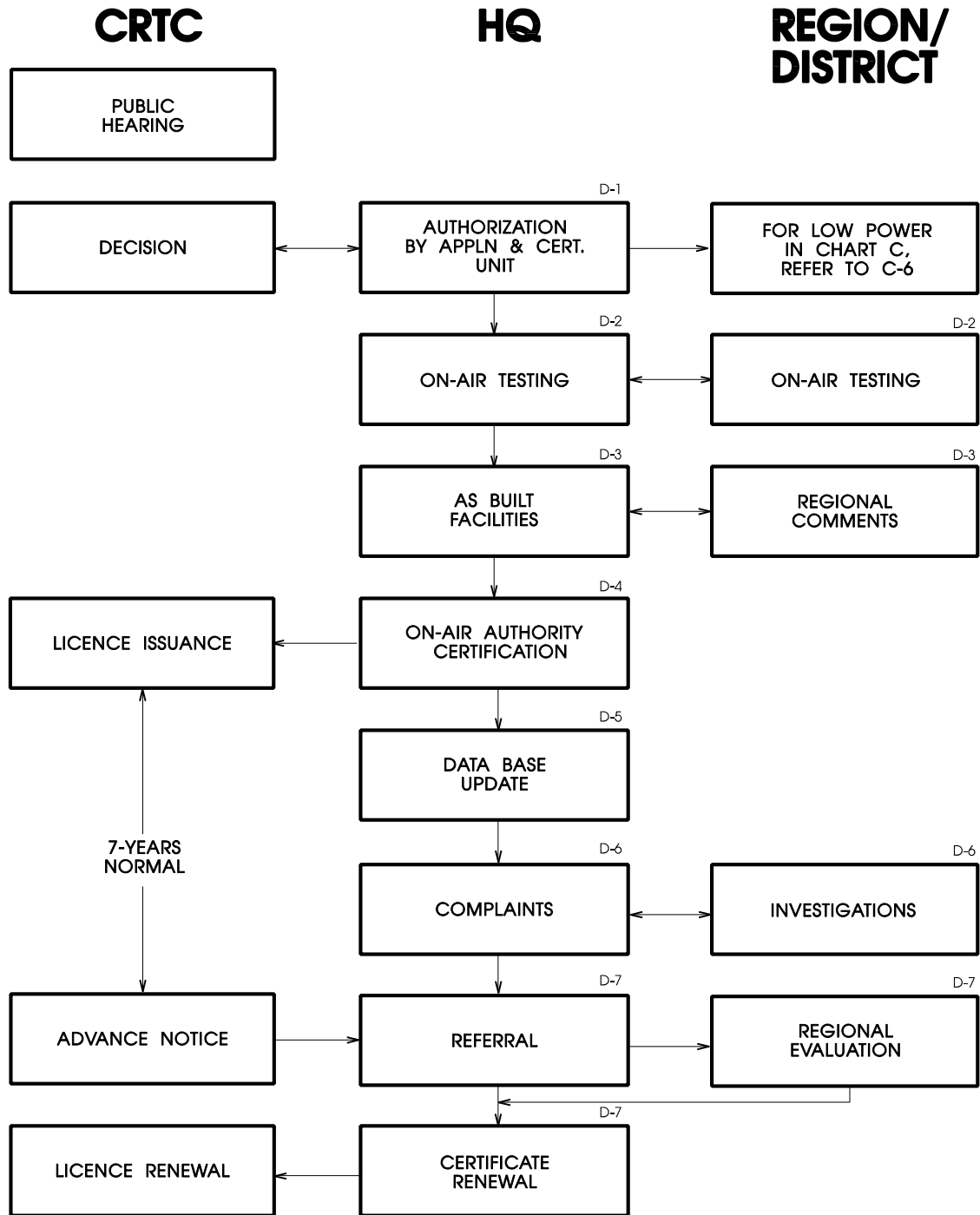
### **Region/District**

Following CRTC approval of the application, Region/District issues a letter of authorization for construction of the facilities.

Co-ordination with HQ is required for:

- call sign assignment;
- FM/NAV/COM conditions, where applicable.

## D - CERTIFICATION



## D - CERTIFICATION

### D1 - Authorization

The Applications and Certification Unit, upon receipt of a CRTC decision approving the application, checks decision contents with authorized parameters and then proceeds to issue a letter of authority setting conditions of construction and on-air testing. Contents are verified by the engineering staff and copies are sent to the Region, the District, the CRTC and the consultant.<sup>1</sup>

### D2 - On-air Testing

#### Region/District

The District gives permission for on-air testing following receipt of the request and informs the Region and HQ. Control of tests and problem solving are effected at this level. The regional office has a supervisory role and will keep HQ informed of any problems. Where FM is concerned, there is a co-ordination role with Transport Canada. At the end of the tests, the Region, upon request by HQ, will make recommendations. Refer to BC-15 for detailed description on on-air testing.

#### HQ

HQ's role is an indirect supervisory one. Direct intervention may be required if resolution of problems at the local level appears unlikely. In the case of FM, there is a more active participation depending on the conditions for FM/NAV/COM testing. In the case of AM, test results are used by the consultant to submit a preliminary proof of performance for engineering evaluation by HQ (see E-PROOFS).

### D3 - As-Built Facilities

At the time of consultant's certification of the facilities, before or after on-air tests, constructed facilities may not be those authorized. There is then consultation involving the licensee, HQ, the Region and the CRTC concerning action to be taken. The latter may involve:

- a CRTC administrative decision if changes are not significant;
- a revision to the brief and a possible Public Notice by the CRTC;
- a major amendment to the approved application and a new Public Hearing if changes are significant.

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<sup>1</sup> For low power applications from the new class of client, the letter of authority is prepared in the Region or District as described in C-6.

In the latter two cases, technical processing as in B may take place. However, Industry Canada and the CRTC approval are normally required before on-air authority is granted.

#### **D4 - On-air Authority and Certification**

Following satisfactory on-air testing and verification with the Region (see D2), HQ grants authority for regular broadcasting. In the case of AM, approval of the preliminary proof of performance is also a requisite. Shortly afterwards, a broadcasting certificate is issued for the new undertaking, comprising conditions for operation of the station. Official coverage maps and data sheets are also prepared for distribution. In parallel, the CRTC issues a broadcasting licence.

#### **D5 - Database Update**

The file for the station is reviewed and a final updated entry is made for the station.

#### **D6 - Complaints**

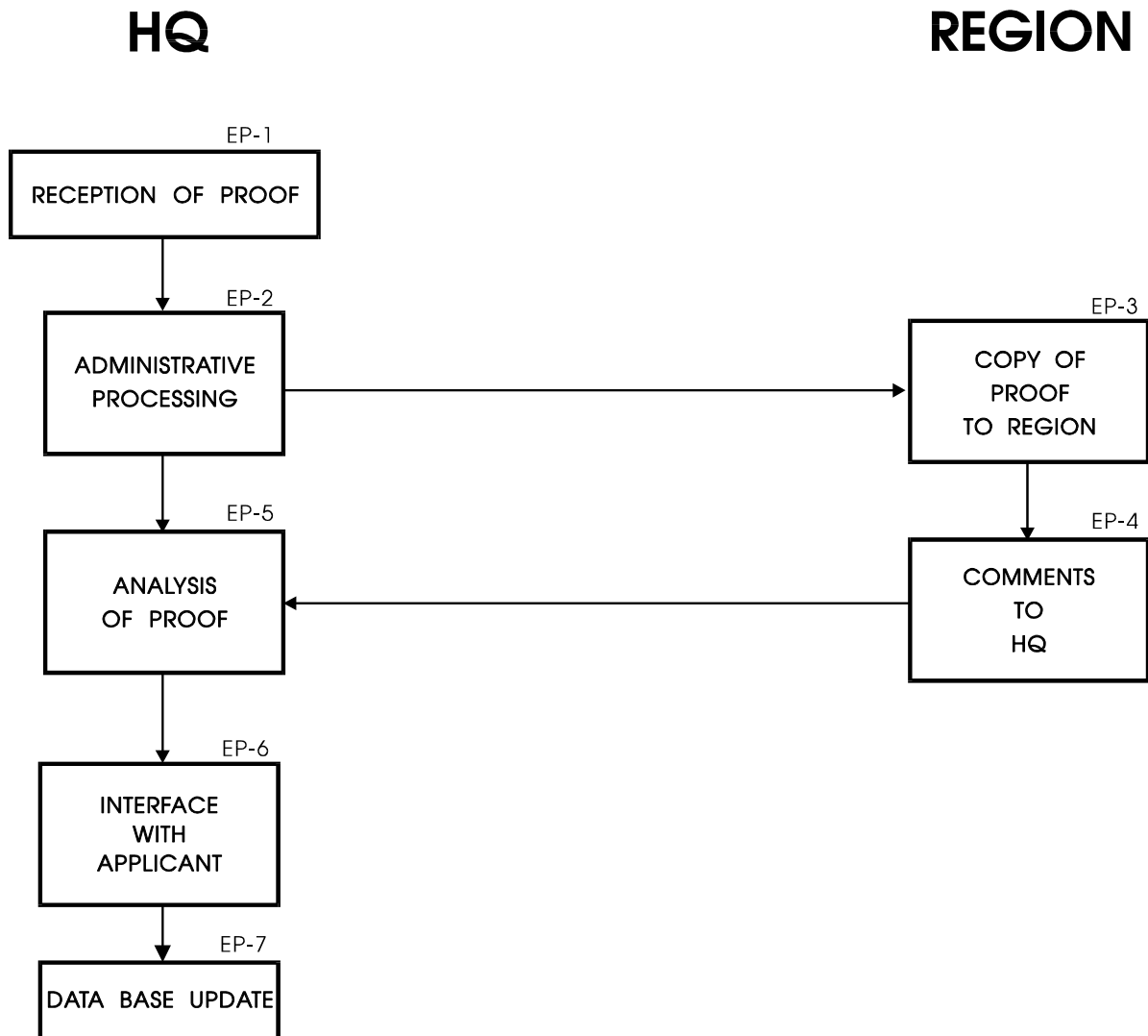
Public complaints regarding station operation or signal reception are received through the CRTC or directly in Industry Canada. The complaint is normally investigated by district officers. Resolution of problems may, depending on the case, be effected at district, regional or, in special circumstances, at HQ level in consultation with the Region.

#### **D7 - Certificate Renewal**

Two years before licence expiration, CRTC refers to HQ the list of licences up for renewal. This list is referred to the Region for their comments.

The Region/District either inspects the undertaking or reviews its file for information on performance to enable it to recommend renewal, denial or short-term renewal of the certificate. The last two recommendations must be justified and HQ will consult with the Region/District before informing the CRTC of its decision. Regional comments should be received at HQ at least one year before the CRTC licence expiration date.

# E - AM PROOF ANALYSIS PRELIMINARY PROOFS



## **E - PROOFS**

### **Preliminary Proof of Performance Analysis - AM**

#### **EP-1 Receipt of Proofs**

The process of receiving the documents, reviewing files, etc.

#### **EP-2 Administrative Processing**

Consists of administrative database entries for the PC/LAN system.

#### **EP-3 Copy to Region**

Copy of Proof is sent to the regional office.

#### **EP-4 Comments to HQ**

Any pertinent comments on proof in relation to what has taken place locally during construction or during implementation of change.

#### **EP-5 Analysis of Proof**

Verify compliance with technical brief on key parameters - radiation at critical angles (day and night service), power, coverage, augmentations.

#### **EP-6 Interface with Applicant**

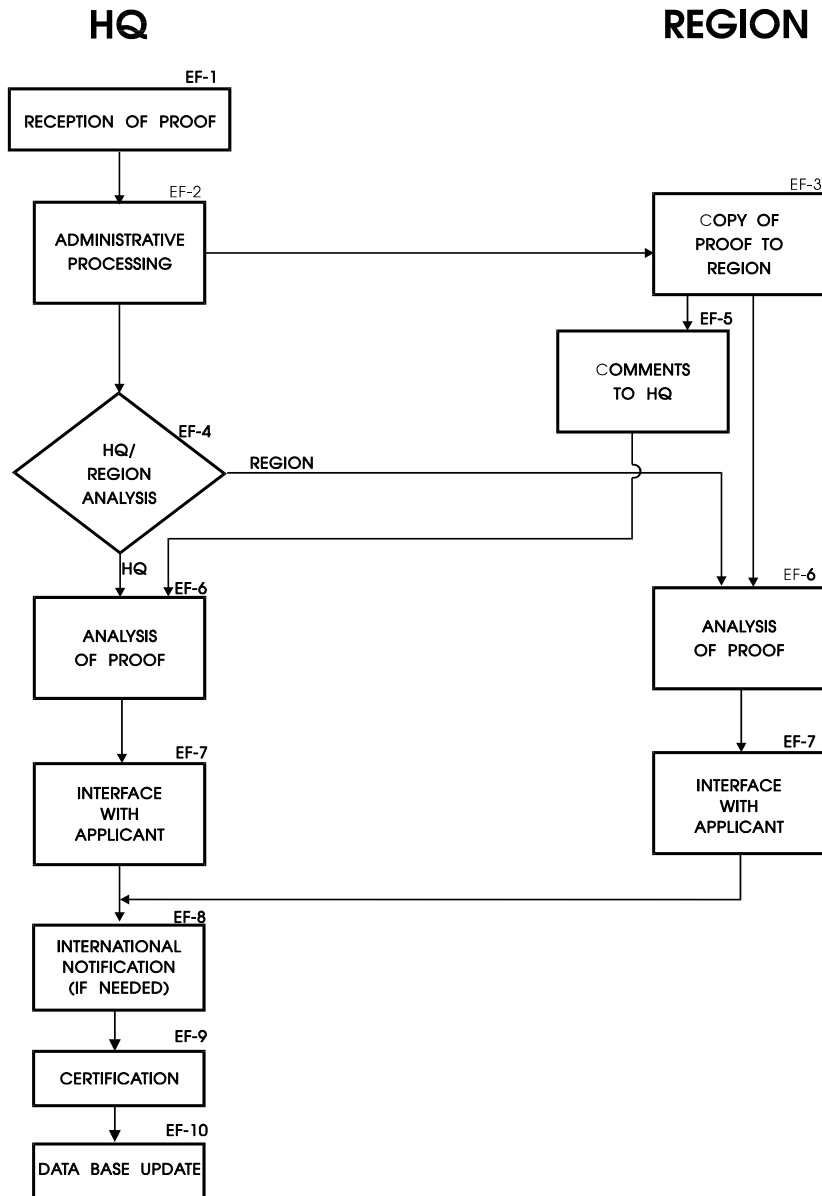
During the analysis of the Proof of Performance and when the analysis is completed, communications take place with the applicant and the consultant to discuss matters related to the proof submitted. Correspondence to confirm discussions is sent and a final letter approving the proof is also sent.

HQ issues on-air authority, usually by fax.

#### **EP-7 Database Update**

Updates to the database on technical and administrative parameters are made to reflect any modifications that took place since the initial entries. All database entries are made by HQ.

## E - AM PROOF ANALYSIS FINAL PROOFS



## **E - PROOFS**

### **Final Proof of Performance Analysis - AM**

#### **EF-1 Receipt of Proofs**

The process of receiving the documents, reviewing files, etc.

#### **EF-2 Administrative Processing**

Consists of administrative database entries for the PC/LAN system.

Acknowledgement of receipt of documents is sent at this point after assuring that all the information required is included.

#### **EF-3 Copy to Region**

Copy of Proof is sent to the regional office.

#### **EF-4 HQ/Region Analysis**

Cursory examination of proof.

HQ determines if analysis is to be made at HQ or Region using criteria in BC-16, AM Proofs of Performance.

Criteria used: complexity of case, if there are particular problems, on-air proof, etc.

#### **EF-5 Comments to HQ**

Any pertinent comments on proof analyzed in HQ in relation to what has taken place locally during construction or during implementation of change.

#### **EF-6 Analysis of Proof**

Detailed analysis of proof.

Check technical parameters against brief.

Coverage/patterns.

Protection at critical angles (day and night services).

Protection to other Canadian & International stations.

Measures taken to protect public from RF exposure.

**EF-7 Interface with Applicant**

During the analysis of the Proof of Performance and when the analysis is completed, communications take place with the applicant and the consultant to discuss matters related to the proof submitted. Correspondence to confirm discussions is sent and a final letter approving the proof is also sent. Copy of letter is sent to HQ when analysis done at Region, and vice versa.

HQ issues on-air authority, usually by fax.

**EF-8 International Notification**

Parameters are notified as being in operation. Augmentations or significant distortions to patterns require notification not because they cause interference but because they represent changes to a station's parameters.

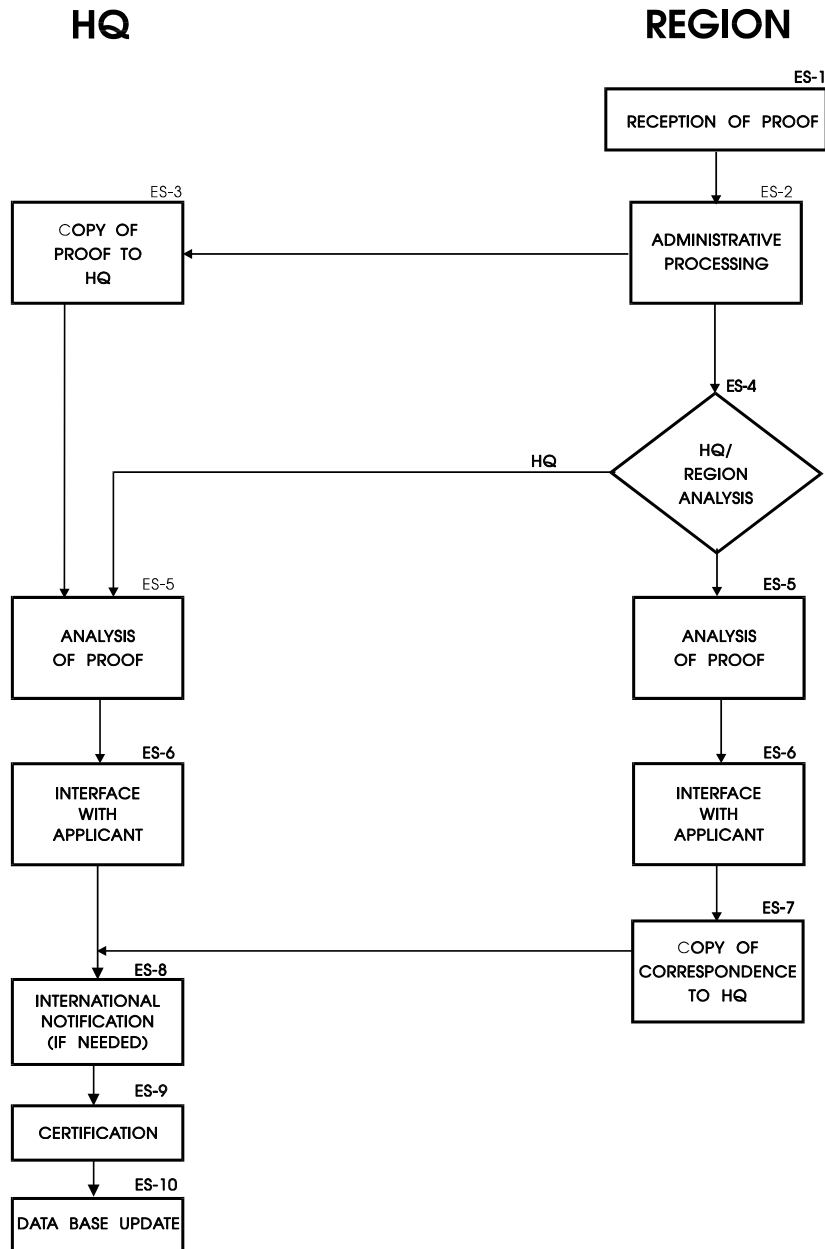
**EF-9 Certification**

After the proof is approved, a new certificate or modifications to it are prepared and sent to the applicant by the Applications and Certification Unit.

**EF-10 Database Update**

Updates to the database on technical and administrative parameters are made to reflect any modifications that took place since the initial entries. All database entries are made by HQ.

## E - AM PROOF ANALYSIS SUPPLEMENTARY PROOFS



## **E - PROOFS**

### **Supplementary Proof of Performance Analysis - AM**

#### **ES-1 Reception of Proofs**

The process of receiving the documents, reviewing files, etc.

#### **ES-2 Administrative Processing**

Consists of administrative database entries for the PC/LAN system.

Acknowledgement of receipt of documents is sent at this point after assuring that all the information required is included.

#### **ES-3 Copy to HQ**

Copy of Proof is sent to HQ after analysis.

#### **ES-4 HQ/Region Analysis**

Cursory examination of supplementary proof by Region.

Region highlights any significant departure from Final Proof related to pattern distortions, re-radiation issues, need for augmentations, unique cases and analysis taken-up by HQ.

#### **ES-5 Analysis of Proofs**

Analysis of the particular problems identified with the supplementary proof in ES-4 above.

#### **ES-6 Interface with Applicant**

During the analysis of the Proof of Performance and when the analysis is completed, communications take place with the applicant and the consultant to discuss matters related to the proof submitted. Correspondence to confirm discussions is sent and a final letter approving the proof is also sent.

**ES-7 Copy of Correspondence to HQ**

Region sends copy of its correspondence with applicant to HQ.

Comments on Certificate Renewal sent to HQ.

**ES-8 International Notification**

Takes place if augmentations are proposed or if significant distortions to patterns require notification not because they cause interference but because they represent changes to a station's parameters.

**ES-9 Certification**

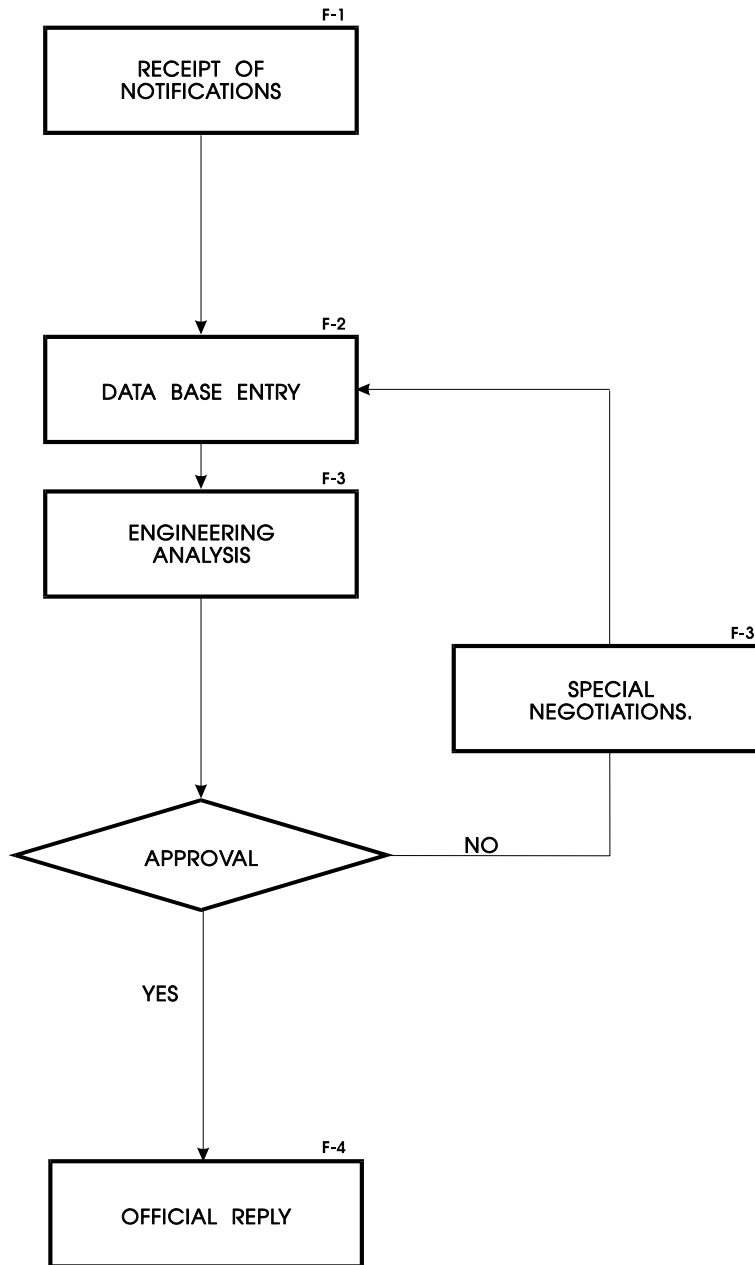
After the proof is approved, modifications to the Certificate are prepared where required and sent to the applicant by the Applications and Certification Unit.

**ES-10 Database Update**

Updates to the database on technical and administrative parameters are made to reflect any modifications that took place since the initial entries. All database entries are made by HQ.

# **F - FOREIGN NOTIFICATIONS**

## **( HQ PROCESS )**



## **F - FOREIGN NOTIFICATIONS**

### **F1 - Receipt of Notifications**

Canada has signed agreements with the Administrations of the U.S.A., France and Region II countries for the notification of broadcasting assignments that have an impact beyond borders.

### **F2 - Database Entry**

Date of receipt and technical data are entered.

### **F3 - Engineering Analysis and Special Negotiations**

Station or frequency notifications are analyzed for compliance with technical criteria under the agreements. TV and FM Agreements or Working Arrangements thereunder, identify conditions for approval. If a notification fails the technical tests, it is only stated that each Administration may proceed with special negotiations on a case-by-case basis. Consequently, such cases are evaluated on a basis of saleability, reciprocity based on dealings across the whole country, precedents and experience. After a decision is taken, special negotiations are undertaken.

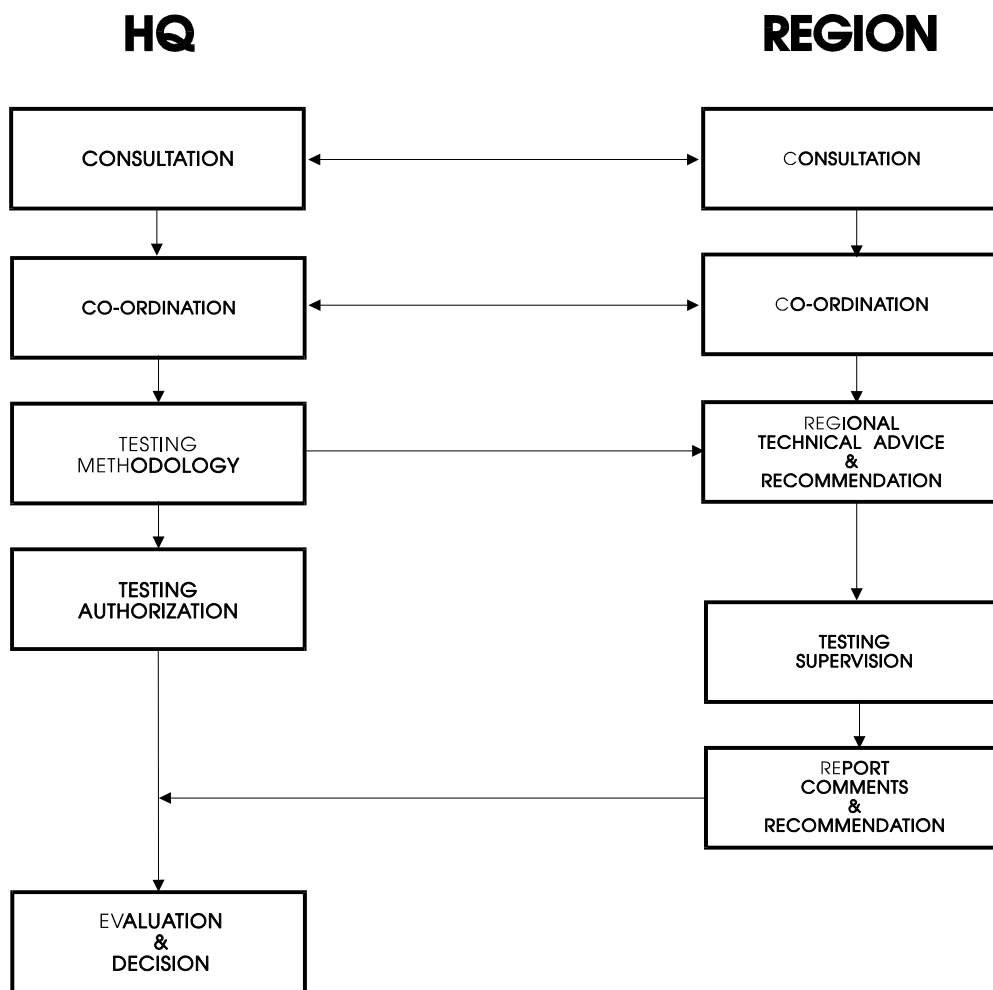
The situation in AM is dissimilar as criteria generally have to be met, and the process must comply with I.T.U. Agreements involving the countries that are party to the Agreements. The I.T.U. Radio Regulations must be used for non-party countries. However, there is still a limited flexibility for educated discussions and expert negotiations. Such negotiations have taken place over the years and resulted in benefits to Canada as well as the other administrations.

### **F4 - Official Reply**

When the above process is completed a letter is issued as the formal reply from the Canadian Administration.

**Note:** For Canadian notifications, see B1-HQ (f) and C4-HQ (c).

## **G - EXPERIMENTAL AUTHORIZATION**



## **G - EXPERIMENTAL AUTHORIZATION**

### **Preamble**

Whenever the relaxation of a technical rule is contemplated, as related to an application, or novel applications in the broadcasting service are discussed with the Department, experimental testing authorization may be granted with a view to advancing the technology and to increasing the efficiency of spectrum utilization. This is not to be confused with experimental authorizations or laboratory testing with a view to determining technical criteria in support of a new rule or of new technologies.

### **Consultation**

The process normally starts with consultation. There, the objectives of the proposal are defined. Co-ordination between HQ and the Region takes place and the methodology selected, and a schedule agreed to. The Region is charged with supervising the tests. A report and recommendations are submitted for HQ's evaluation. Technical assessment is based on engineering expertise and progressive experience. Overall judgment and decision are made. Letters granting formal authorization for tests and final disposition of proposal are issued by HQ.